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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/749,276	12/31/2003	John T. Loper	EI-7627	8539

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EXAMINER
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GOLOBOY, JAMES C

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 09/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/749,276

**Applicant(s)**

LOPER ET AL.

**Examiner**

James Goloboy

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 December 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☒ Claim(s) 7,13 and 28 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Specification***

1. The disclosure is objected to because of the following informalities: On page 4 line 23 of the specification, "inertly instituted" should be "inertly substituted".

Appropriate correction is required.

### ***Claim Objections***

2. Claims 7, 13, and 28 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim.

Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claims 7, 13, and 28 recite a viscosity index improver selected from the group consisting of olefin copolymers, polymethacrylates, and styrene-maleic esters. This fails to further limit the subject matter of Claims 6, 12, and 27, which recite an unrelated group of nitrogen-containing compounds as viscosity index improvers.

It is the examiner's position that applicant means to claim a graft polymer where the nitrogen-containing compounds of Claims 6, 12, and 27 are grafted onto the polymeric backbones of Claim 7. Claims 6-7, 12-13, and 27-28 have been considered together in this manner in paragraphs 13, 15, and 18 below.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 6, 12, 21, and 27 are rejected under 35 U.S.C. 112, first paragraph, in view of the evidence given by Pirro (*Lubrication Fundamentals*, Second Ed., page 22) and De Groot (U.S. Pat. No. 6,548,606), as failing to comply with the enablement requirement. The claims contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 6, 12, 21, and 27 recite various nitrogen-containing molecules as viscosity-index improvers. The specification, on page 12 lines 15-26, only discloses the use of these compounds when they are grafted onto an olefin copolymer.

Viscosity index (VI) improvers are known to those skilled in the art as polymeric materials. Pirro defines VI improvers as "long-chain, high-molecular weight polymers", and notes that their VI improving properties arise from changes in the polymer's configuration at different temperatures. Graft polymers where the nitrogen-containing compounds recited in the present claims are grafted onto an olefin copolymer are known as VI improvers; however, De Groot, in column 1 lines 26-40, makes it clear that the nitrogen-containing molecule is added for its dispersant qualities, while the VI improving properties come from the polymeric backbone.

In light of the above evidence, it is the examiner's position that the use of the compounds recited in Claims 6, 12, 21, and 27 as VI improvers has not been sufficiently enabled to one skilled in the art.

***Claim Rejections - 35 USC § 101***

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claims 6, 12, 21, and 27 are rejected under 35 U.S.C. 101 in view of the evidence given by Pirro (*Lubrication Fundamentals*, Second Ed., page 22) and De Groot (U.S. Pat. No. 6,548,606), because the disclosed invention is inoperative and therefore lacks utility.

Claims 6, 12, 21, and 27 recite various nitrogen-containing molecules as viscosity-index improvers. The specification, on page 12 lines 15-26, only discloses the use of these compounds when they are grafted onto an olefin copolymer.

Viscosity index (VI) improvers are known to those skilled in the art as polymeric materials. Pirro defines VI improvers as "long-chain, high-molecular weight polymers", and notes that their VI improving properties arise from changes in the polymer's configuration at different temperatures. Graft polymers where the nitrogen-containing compounds recited in the present claims are grafted onto an olefin copolymer are known as VI improvers; however, De Groot, in column 1 lines 26-40, makes it clear that

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the nitrogen-containing molecule is added for its dispersant qualities, while the VI improving properties come from the polymeric backbone.

In light of the above evidence, it is the examiner's position that the compounds recited in Claims 6, 12, 21, and 27 are inoperative as VI improvers and therefore lack utility.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 4-5, 9-10, 16, 19-20, and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Carlisle (U.S. Pat. No. 5,397,489).

Carlisle discloses in column 1 lines 59-64 the reaction of a dispersant and a polyacrylate. In column 3 lines 28-50, and in column 8 lines 11-13 (Example 4), Carlisle shows that a polyacrylamide may be used in place of the polyacrylate, and in column 2 lines 8-22 Carlisle further discloses that suitable dispersants include hydrocarbyl-substituted succinimides, Mannich condensation products of a hydrocarbyl-substituted phenol with an aldehyde and a polyalkene amine, or hydrocarbyl-substituted polyamines, as in the reactants recited in Claims 1, 4-5, 16, and 19-20. In column 7 line 3 Carlisle discloses a succinimide reactant with a hydrocarbyl substituent of number average molecular weight about 1000, falling squarely within the range disclosed in

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Claims 1 and 16. Carlisle also discloses in lines 1-2 of the abstract that the reaction product is useful as a dispersant additive in a lubricating oil.

In column 6 line 58 Carlisle discloses that the additive may be used in lubricating oil compositions for automotive use. An automobile is a vehicle with moving parts, as recited in Claim 10. Carlisle also discloses in column 6 line 61 that the additive may comprise 10% by weight of the overall lubricating oil composition, anticipating the ranges recited in Claims 9, 10, and 23.

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. Claims 2, 17, and 30-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carlisle in view of Mishra (U.S. Pat. No. 6,350,723).

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The discussion of Carlisle in paragraph 3 above is incorporated here by reference. The acrylamide disclosed by Carlisle does not have the structures recited in Claims 2, 17, and 30-32. From column 5 line 52 through column 6 line 34 Carlisle does disclose a reaction product with the B-D(-E)-B formula recited in Claim 30 (the reference's structure IV, where  $x$  and  $y = 0$ ).

Mishra, in column 2 lines 58-62, describes a series of dispersant dialkylaminoalkylacrylamide monomers, such as N,N-dimethylaminopropylacrylamide, which have the structure recited in Claims 2, 17, and 30, where  $R^1$  is an alkenyl group,  $R^2$  is a hydrogen, and  $R^3$  is an amine group. The acrylamide monomers disclosed by Mishra also have the structure recited in Claim 31, where  $R^3$  and  $R^4$  are hydrogen,  $R^5$  is an alkylene group, and  $R^6$  and  $R^7$  are alkyl groups. Although the acrylamides taught by Mishra are used as monomers for block copolymers, they are within the lubricant art and one of ordinary skill would have understood that the dispersant properties of the monomer would yield an advantage within a non-polymeric product as well.

The dispersant in structure IV of Carlisle, where  $R^{10}$  and  $R^{13}$  are succinic groups,  $R^{17}$  is an alkylene group and  $Y^1$  is a dispersant acrylamide taught by Mishra forms the bis-succinimide compound recited in Claim 32.

Carlisle discloses in column 6 lines 28-33 that the hydrocarbyl substituents of the succinimide (the  $R^8$  and  $R^{10}$  recited in Claim 33) are preferably derived from polyisobutylene, and may have between 30 and 300 carbons, overlapping or encompassing the ranges recited in Claims 32 and 33.



It would have been obvious to one of ordinary skill in the art to modify Carlisle by reacting the dispersant with an acrylamide of the type taught by Mishra, in order to further improve the dispersant properties of the product, due to the dispersant properties of the acrylamides taught by Mishra.

12. Claims 3 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carlisle in view of Watts (U.S. Pat. No. 5,811,377).

The discussion of Carlisle in paragraph 3 above is incorporated here by reference. Carlisle does not disclose the ratio of succinic acid or anhydride to olefin in a hydrocarbyl-substituted succinimide.

Watts, in column 2 lines 58-61, discloses a hydrocarbyl-substituted succinimide with a ratio of succinic anhydride to olefin of between 1:1 and 5:1, and more preferably between 1:1 and 3:1, falling within and substantially overlapping the ranges recited in Claims 3 and 18, and disclosing one of the endpoints of the range of Claim 18.

It would have been obvious to one of ordinary skill in the art to use in the lubricant additive of Carlisle a hydrocarbyl-substituted succinimide with the succinic anhydride to olefin ratio taught by Watts in order to attain dispersancy.

13. Claims 6-8 and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carlisle in view of Liesen (U.S. Pat. No. 6,255,261).

The discussion of Carlisle in paragraph 3 above is incorporated here by reference. Carlisle discloses in column 6 lines 51-52 that a viscosity index improver may be added to the composition, but does not disclose specific viscosity index improvers.

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From column 9 line 56 through column 10 line 4, Liesen teaches multifunctional viscosity index improvers, where a nitrogen-containing compound is grafted onto an olefin copolymer. The list of suitable nitrogen-containing compounds from column 9 line 62 through column 10 line 4 includes all the compounds recited in Claim 6 and 21 except N-arylphenylenediamines, and in column 7 line 47 Liesen teaches that N-arylphenylenediamines are also usable.

In column 4 lines 47-50 Liesen discloses that styrene-maleic esters, polyalkylmethacrylates, and olefin copolymers are also usable as viscosity index improvers, as recited in Claims 7-8 and 22.

It would have been obvious to one of ordinary skill in the art to include in Carlisle a viscosity index improver taught by Liesen, in order to obtain a desired viscosity-temperature behavior, and in the case of the graft polymers, to obtain dispersant activity with the same additive.

14. Claims 11 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carlisle in view of Papay (U.S. Pat. No. 5,652,201).

The discussion of Carlisle in paragraph 3 above is incorporated here by reference. Carlisle does not disclose an additive containing two dispersants.

Papay discloses in columns 15-23 multiple types of dispersants, including hydrocarbyl-substituted succinimides, hydrocarbyl-substituted amines, and Mannich polyamine dispersants. In columns 24-25, and again in column 44 lines 57-58 Papay teaches that multiple dispersants can be used in an additive, as recited in Claim 11, and

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in column 50 lines 12-14 provides ranges of 0.1 to 15% by weight and 0.5 to 10% by weight for the concentration of dispersant ("component b") in a lubricant composition.

Both ranges strongly overlap the range recited in Claim 15.

It would have been obvious to one of ordinary skill in the art to include in Carlisle multiple dispersant, as taught by Papay, to further improve the dispersing properties of the additive.

15. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carlisle in view of Papay as applied to claim 11 above, and further in view of Liesen.

The discussion of Carlisle in paragraph 3 above is incorporated here by reference. Carlisle discloses in column 6 lines 51-52 that a viscosity index improver may be added to the composition, but does not disclose specific viscosity index improvers.

From column 9 line 56 through column 10 line 4, Liesen teaches multifunctional viscosity index improvers, where a nitrogen-containing compound is grafted onto an olefin copolymer. The list of suitable nitrogen-containing compounds from column 9 line 62 through column 10 line 4 includes all the compounds recited in Claim 6 and 21 except N-arylphenylenediamines, and in column 7 line 47 Liesen teaches that N-arylphenylenediamines are also usable.

In column 4 lines 47-50 Liesen discloses that styrene-maleic esters, polyalkylmethacrylates, and olefin copolymers are also usable as viscosity index improvers, as recited in Claims 7-8 and 22.

It would have been obvious to one of ordinary skill in the art to include in Carlisle a viscosity index improver taught by Liesen, in order to obtain a desired viscosity-temperature behavior, and in the case of the graft polymers, to obtain dispersant activity with the same additive.

16. Claims 24 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carlisle in view of Lambert (U.S. Pat. No. 5,888,947).

The discussion of Carlisle in paragraph 3 above is incorporated here by reference. Carlisle discloses that the lubricant composition may be used in a vehicle with moving parts (an automobile), but does not specifically disclose the method of lubricating moving parts with the lubricant.

Lambert teaches in column 1 lines 21-28 that metal-to-metal contact between moving engine parts leads to wear, and in lines 29-33 teaches that lubricants can reduce wear between moving parts by forming a film between them. Using the lubricant composition of Carlisle in the method of reducing wear in an engine taught by Lambert meets Claims 24 and 26, as an engine is part of the drive train of a vehicle.

It would have been obvious to one of ordinary skill in the art to use the lubricant composition of Carlisle to contact moving parts in a vehicle, specifically in the engine, in order to reduce wear on the moving parts, as taught by Lambert in column 1 lines 21-33 and Lambert's Claims 11 and 18.

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17. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Carlisle in view of Lambert as applied to claim 24 above, and further in view of Papay.

The discussions of Carlisle in view of Lambert in paragraph 11 above and Carlisle in view of Papay in paragraph 9 above are incorporated here by reference. Carlisle in view of Lambert teaches that the lubricant may be used in an internal combustion engine but does not disclose a crankcase oil.

Papay teaches in column 7 lines 50-64 that a lubricant composition can be used in the crankcase of a gasoline or diesel engine, as recited in Claim 25.

It would have been obvious to one of ordinary skill in the art to use the method of lubricating moving parts in a vehicle of Carlisle in view of Lambert in a crankcase, as taught by Papay, in order to reduce wear on the moving parts of the crankcase.

18. Claims 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carlisle in view of Lambert as applied to claim 24 above, and further in view of Liesen.

The discussions of Carlisle in view of Lambert in paragraph 11 above and Carlisle in view of Liesen in paragraph 8 above are incorporated here by reference. Carlisle discloses in column 6 lines 51-52 that a viscosity index improver may be added to the composition, but does not disclose specific viscosity index improvers.

From column 9 line 56 through column 10 line 4, Liesen teaches multifunctional viscosity index improvers, where a nitrogen-containing compound is grafted onto an olefin copolymer. The list of suitable nitrogen-containing compounds from column 9 line 62 through column 10 line 4 includes all the compounds recited in Claim 6 and 21

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except N-arylphenylenediamines, and in column 7 line 47 Liesen teaches that N-arylphenylenediamines are also usable.

In column 4 lines 47-50 Liesen discloses that styrene-maleic esters, polyalkylmethacrylates, and olefin copolymers are also usable as viscosity index improvers, as recited in Claims 7-8 and 22.

It would have been obvious to one of ordinary skill in the art to include in Carlisle a viscosity index improver taught by Liesen, in order to obtain a desired viscosity-temperature behavior, and in the case of the graft polymers, to obtain dispersant activity with the same additive.

### ***Conclusion***

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Boden (WO 96/12746) discusses the manufacture and use of grafted polyolefins in lubricant compositions.

Karol (U.S. Pat. No. 4,554,086) discloses mono- and bis-succinimides with pendant groups.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Goloboy whose telephone number is 571-272-2476. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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